

WHAT IS CLAIMED IS:

1. A system for preventing a call drop from occurring between a CDMA 2000 1xEV-DO (Evolution-Data
5 Optimized) system and a hybrid access terminal in traffic with the CDMA 2000 1xEV-DO system, by limiting a predetermined search time for a 1X system, the system comprising:

the hybrid access terminal operated in a 1X mode
10 in relation to the 1X system for receiving a voice signal transmission service or a low-rate data transmission service from the 1X system and in a 1xEV-DO mode in relation to the 1xEV-DO system for receiving a high-rate data transmission service from the 1xEV-DO
15 system, the hybrid access terminal in traffic with the 1xEV-DO system being periodically switched into the 1X mode so as to update overhead messages and returned to the 1xEV-DO mode if the predetermined search time lapses;

20 a base station transceiver subsystem including a 1xEV-DO access network transceiver for transmitting/receiving packet data to/from the hybrid access terminal and a 1X transceiver for transmitting/receiving voice or data to/from the hybrid
25 access terminal;

a base station controller including a 1xEV-DO access network controller for controlling a packet data transmission service of the 1xEV-DO access network transceiver and a 1X controller for controlling a
30 transmission service of the 1X transceiver; and

a packet data serving node (PDSN) connected to the 1xEV-DO access network controller so as to transmit/receive the packet data to/from the 1xEV-DO system.

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2. The system as claimed in claim 1, wherein the predetermined search time is a time required for updating the overhead messages used for a location register and a call request in the 1X system after the hybrid access terminal in traffic with the 1xEV-DO system is switched into the 1X mode.

3. The system as claimed in claim 1, wherein the hybrid access terminal stops a search work for the 1X system if a time for switching the hybrid access terminal into the 1X mode reaches the predetermined search time and returns to the 1X EV-DO mode.

4. The system as claimed in claim 1, wherein the hybrid access terminal is set to the 1X mode in an idle state thereof in order to make communication with the 1X system and is periodically switched into the 1xEV-DO mode in a predetermined period of time so as to check whether or not data are received through the 1xEV-DO system and returns to the 1X mode.

5. The system as claimed in claim 1, wherein the hybrid access terminal receiving high-rate data from the 1xEV-DO system in the 1xEV-DO mode is periodically switched into the 1X mode in a predetermined period of time so as to check whether or not signals are received through the 1X system and returns to the 1xEV-DO mode.

6. The system as claimed in claim 1, wherein a TDMA (time division multiple access) method is utilized in a case of a forward link transmitting data from the 1xEV-DO system to the hybrid access terminal, and a CDMA (code division multiple access) method is utilized in a case of a reverse link transmitting data from the hybrid access terminal to the 1xEV-DO system.

7. The system as claimed in claim 6, wherein a hard handoff is carried out in case of the forward link by transmitting data with maximum power without performing power control, and a soft handoff is carried out in case of the reverse link while performing the power control with respect to each hybrid access terminal.

10 8. The system as claimed in claim 1, wherein the hybrid access terminal is switched from the 1xEV-DO mode into the 1X mode by tracking frequency of the 1X system under the control of a mobile station modem (MSM) chip.

15 9. The system as claimed in claim 6, wherein the forward link includes a pilot channel used for transmitting a pilot signal allowing the 1xEV-DO system to track the hybrid access terminal, a MAC (medium access control) channel used for controlling the reverse link, a control channel used for transmitting a broadcast message or a direct message for directly controlling a specific hybrid access terminal from the 1xEV-DO system to the hybrid access terminal, and a traffic channel used for transmitting only packet data from the 1xEV-DO system to the hybrid access terminal.

10. The system as claimed in claim 1, further comprising a mobile switching center for providing a communication access route of the 1X system with respect to a communication call transmitted from the hybrid access terminal by switching the communication access route.

11. A method for preventing a call drop from occurring between a CDMA 2000 1xEV-DO (Evolution-Data

Optimized) system and a hybrid access terminal in traffic with the CDMA 2000 1xEV-DO system, by limiting a predetermined search time for a 1X system, the method comprising the steps of:

5 (a) sequentially initializing a 1X mode and a 1xEV-DO mode of the hybrid access terminal such that the hybrid access terminal stays in an idle state;

 (b) alternately and periodically performing monitoring with respect to the 1X system and the 1xEV-DO
10 by using the hybrid access terminal in a state that the hybrid access terminal stays in the idle state;

 (c) allowing the hybrid access terminal to enter a traffic state of the 1xEV-DO mode such that a connection and a session are formed between the hybrid access
15 terminal and the 1xEV-DO system, thereby enabling the hybrid access terminal to transmit/receive packet data to/from the 1xEV-DO system;

 (d) switching the hybrid access terminal into the 1X mode if a predetermined monitoring time lapses;

20 (e) checking a switching time and detecting signals of the 1X system when the hybrid access terminal is switched into the 1X mode; and

 (f) allowing the hybrid access terminal to return to the 1xEV-DO mode if the switching time reaches a
25 predetermined return start time.

12. The method as claimed in claim 11, wherein, in step (a), the hybrid access terminal initializes the 1xEV-DO mode by using system parameters obtained when
30 initializing the 1X mode.

13. The method as claimed in claim 11, wherein, in step (d), the predetermined monitoring time is 5.12 seconds, which is counted after the hybrid access
35 terminal is switched into the 1xEV-DO mode.

14. The method as claimed in claim 11, wherein, in step (e), the predetermined return start time is the switching time at which the hybrid access terminal
5 switched into the 1X mode so as to detect the signals of the 1X system starts to return to the 1xEV-DO mode.

15. The method as claimed in claim 11, wherein, in step (e), the predetermined return start time is shorter
10 than a call drop time required for the call drop between the hybrid access terminal and the 1xEV-DO system.

16. The method as claimed in claim 15, wherein the predetermined return start time is set as integer times
15 of SCI (slot cycle index).

17. The method as claimed in claim 15, wherein the predetermined return start time is set as 3.36 seconds or 4.48 seconds.
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18. The method as claimed in claim 11, wherein, in step (e), the hybrid access terminal stores the overhead messages received therein while detecting the 1X system in a predetermined memory.
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19. The method as claimed in claim 11, wherein, in step (f), an operation of allowing the hybrid access terminal to return to the 1xEV-DO mode is performed through a searcher module, which tracks frequencies used
30 in the 1xEV-DO system under a control of an MSM chip accommodated in the hybrid access terminal.

20. The method as claimed in claim 11 or 18, wherein the hybrid access terminal uses the essential
35 overhead messages received and stored during a previous

search of the 1X system for a next search of the 1X system.

21. The method as claimed in claim 20, wherein the
5 overhead messages include at least one of a system parameter message, an access parameter message, an extended system parameter message, a neighbor list parameter message, and a channel 1 st parameter message.

10 22. A hybrid access terminal for preventing a call drop from occurring between a CDMA 2000 1xEV-DO (Evolution-Data Optimized) system and the hybrid access terminal in traffic with the CDMA 2000 1xEV-DO system, the hybrid access terminal comprising:

15 a timer for measuring a switching time when the hybrid access terminal is switched from the 1xEV-DO mode to the 1X mode;

a searcher module for tracking and converting frequency so as to perform the switching of the hybrid
20 access terminal between the 1X mode and the 1xEV-DO mode, and receiving overhead messages;

a finger module for demodulating the overhead messages received from the searcher module; and

25 a mobile station modem (MSM) chip alternately and periodically searching the 1xEV-DO system and the 1X system, creating a return control signal if the MSM chip receives a return start signal from the timer while searching the 1X system, and delivering the return control signal to the searcher module.

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23. The hybrid access terminal as claimed in claim 22, wherein the timer creates the return start signal if the measured switching time reaches the predetermined return start time to deliver the return start signal to
35 the MSM chip.

24. The hybrid access terminal as claimed in claim
22, wherein the hybrid access terminal searches
frequencies used in the 1X system or 1xEV-DO system
5 according to a predetermined monitoring period so as to
be operated in the 1X mode or 1xEV-DO mode.

25. The hybrid access terminal as claimed in claim
22, wherein the MSM chip has information about the
10 return start time, and checks the switching time
measured by the timer to create and deliver the return
control signal if the switching time reaches to the
return start time.